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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,074

04/14/2006

Mane-Si Laure Lee

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LOWE HAUPTMAN & BERNER, LLP  
1700 DIAGONAL ROAD, SUITE 300  
ALEXANDRIA, VA 22314

EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,074	<b>Applicant(s)</b> LEE ET AL.	
	<b>Examiner</b> Audrey Y. Chang	<b>Art Unit</b> 2872	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12, 14 and 17-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12, 14, and 17-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Remark*

- This Office Action is in response to applicant's amendment filed on June 27, 2008, which has been entered into the file.
- By this amendment, the applicant has amended claims 12, 14-19 and 21-22 and has canceled claims 13 and 15-16.
- Claims 12, 14 and 17-22 remain pending in this application.

### *Specification*

1. The disclosure is objected to because of the following informalities: the equation for the parameter  $\alpha$  as stated in paragraph [0042] contains typographic error.

Appropriate correction is required.

### *Claim Objections*

2. **Claims 12, 14 and 17-22 are objected to because of the following informalities:**

(1). The newly amended phrase "in a direction on said surface" recited in claim 12 is confusing since a surface is usually a two dimensional plane, it is not clear which direction is referred to with all the directions defined by a two dimensional plane.

(2). The phrase "the effective index decreases (or increases) with the fill factor" recited in claim 12 is confusing and is not making definite sense since it is not clear the decrease or increase is with what *property* of the fill factor? It is not clear if the decrease (or increase) of the effective index is with the decrease or increase of the fill factor.

(3). The phrase "the effective index due to the fill factor" recited in claim 12 is better versed as "the effective index **with respect to** the fill factor".

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(4). A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 12 recites the broad recitation a single diffraction order, and the claim also recites "i.e. the blaze order" which is the narrower statement of the range/limitation.

(5). It is not clear what is considered to be "blaze order". The diffraction orders are conventionally be referred as zero-th, first, second, third etc. orders. It is not clear if the blaze order is referred to zero-th, first, second or other orders of the diffractions. Please specify.

(6). The phrase "a diffractive optical element as claimed in claim 13" recited in claim 20 is confusing since claim 13 has been canceled. The scopes of the claim 20 and its dependent claims 21 and 22 are therefore indefinite since they depend from a canceled claim.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**4. Claims 12, 14 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Diffractive phase elements based on two-dimensional artificial dielectric" by Chen et al (Optics Letters, Vol. 20, No. 2, pages 121-123).**

Chen et al teaches a *blaze* diffractive element serves as a *zones for a Fresnel lens* wherein at least one of the optical zones comprises a first portion contains pillars of varying size (i.e. with variable fill factor) wherein the pillars has an effective index that decreases with the decrease of the fill factor, (please see Figure 1) and a second portion of holes of varying size (i.e. with variable fill factor) wherein the effective index of the hole portions increases with the decreases of the fill factor, (please see Figure 2). The pillars and holes serve as the microstructures. Chen et al teaches that the diffractive element has effective index ranging from 1.07 to 1.46 (i.e. ranging from minimum to maximum). Since the pillars and holes are etched in the quartz layer, this means the sizes of pillars and holes or the fill factor are varying along the surface of the quartz, (please see page 122, second and third paragraphs).

Chen et al teaches that the maximum and minimum refractive index of the composite material for the pillar portion and hole portion are determined by the curves of variation in the effective index with respect to the fill factor, as shown in Figures 1 and 2.

This reference has met all the limitations of the claims, with the exception that it does not teach explicitly about the parameter " $\alpha$ " as recited in the claim. However it is implicitly true that the optical material, such as quartz or fused silica" has implicit dispersion property, namely the refractive index is a non-constant function of the wavelength. The  $\alpha$  parameter recited in claim 12 is nothing but the dispersion property of the artificial material based on quartz. From Figures 1 and 2, one can easily obtain the maximum and minimum effective indices with respect to the fill factors. And with the inherent

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dispersion property for the composite material one can deduce the parameter as claimed. One skilled in the art also can design the blaze diffractive element to have desired diffraction order.

With regard to claim 14, it is obvious matters of design choice to make one the optical zones has one geometry of the microstructures for the benefit of making the zone with the composite material to have a desired effective index.

With regard to claims 17 and 18, this reference however does not teach explicitly that the zones are referred to Fresnel zones or echelette grating, however it is known in the art that binary grating can be formed within Fresnel zones or echelette grating, such modification would have been obvious to one skilled in the art.

With regard to claim 19, although this reference does not teach explicitly that the parameter has the values between 0.3 to 0.5, such modification is considered to be obvious matters of design choice to one skilled in the art to make the diffractive element achieves desired properties since the dispersion property of the material is known and the effective indices of the material are also known.

With regard to claims 20-22, this reference does not teach explicitly that the optical system is for imaging, however it has been held it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Madham*, 2 USPQ2d 1647 (1987).

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 12, 14 and 17-22 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (9:00-4:30), alternative Mondays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

***Audrey Y. Chang, Ph.D.***  
***Primary Examiner***  
***Art Unit 2872***

A. Chang, Ph.D.  
/Audrey Y. Chang/  
Primary Examiner, Art Unit 2872